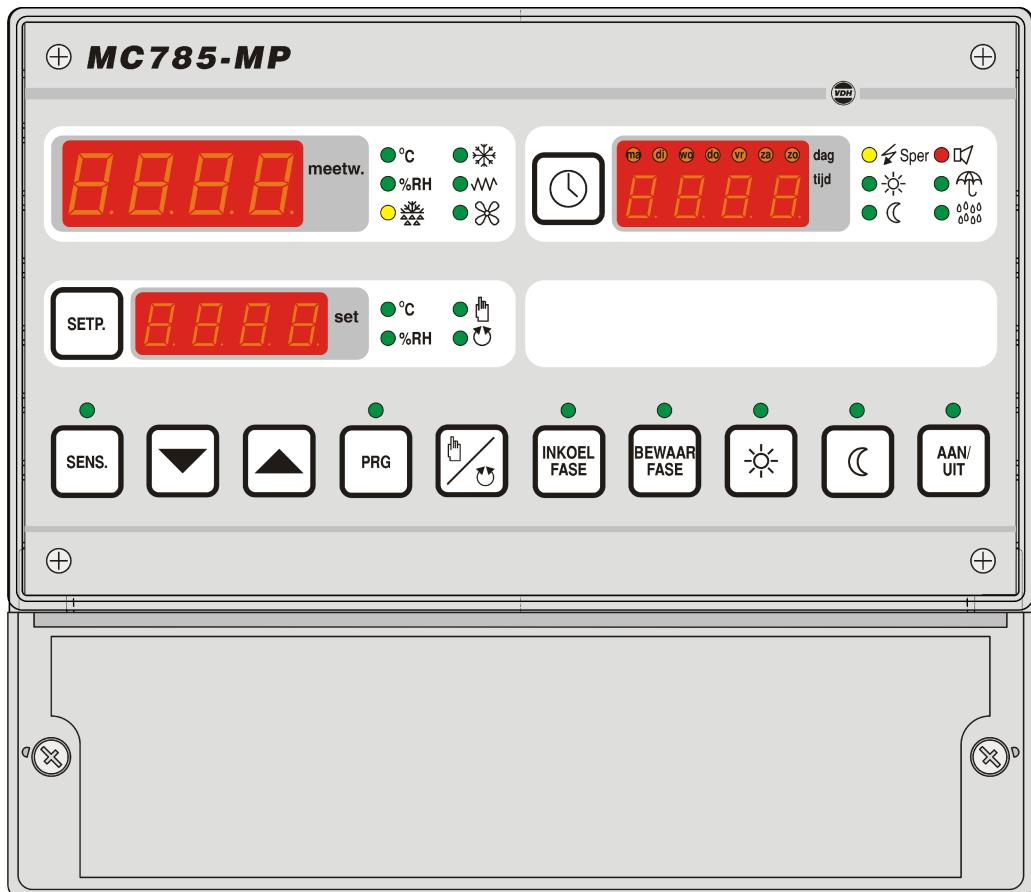


MC 785-MP

User manual
(Wall- and Panel-mount version with Dutch front)



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User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 2 of 28

Table of contents

1. Technical specifications	3
1.1 MC 785-MP controller	3
1.2 LMS RELAY MODULE (extension)	6
1.3 LMS Pt100 MODULE (extension)	6
1.4 LMS RH/Pt100 MODULE (extension)	6
1.5 LMS SUPPLY MODULE for extension modules	6
2. Functional specifications	7
3. Control	9
3.1 Turning the controller on/off	9
3.2 Reading out the sensor groups	9
3.3 Reading out sensors apart	9
3.4 Reading out and changing setpoints	9
3.5 Setting controller mode	10
3.6 Adjusting the ventilation cooling mode	10
3.7 Adjusting the defrost mode	10
3.8 Starting defrosting manually	10
3.9 Starting humidification manually	10
3.10 Reading out and adjusting the time and pulse counters, reading inside RH	11
3.11 Manual day / night setting	11
3.12 Manual start drying	12
3.13 Info menu	12
4. Adjusting internal parameters	12
5. Sensor calibration	20
6. Alarms	20
7. Front view	21
8. Connections	22
9. Dimensions	25
Appendix A: Items in the info menu	27

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 3 of 28

1. Technical specifications

1.1 MC 785-MP controller:

General

Type : MC 785-MP (Multi Purpose) thermostat

Wall mounting:

Housing : Grey plastic
 Material : Polystyrol 454h KG 2 natur BASF
 Dimensions : 213 x 180 x 85mm (whd)
 Front : Polycarbonate (IP-44)

Panel mounting:

Housing : Steel sheet panel
 Material : Steel sheet sprayed silver-grey
 Dimensions : 217 x 155 x 85mm (whd)
 Panel cutout : min. 208 x 146mm (wh)
 Front : Polycarbonate (IP-44)

Temperature range : -40.0/+50.0°C at 0.1°C

Power supply : 230 VAC; 50/60 Hz (-10/+5%).

Power consumption : 9 VA

Operation temperature : -20/+50°C

Storage temperature : -20/+60°C

Operation humidity : 10/+90 % relative humidity non-condensing

Accuracy : ± 0,5 % from the range

Note:

The software version number of the MC 785-MP controller can be retrieved using parameter P991.

In order to make sure that multiple MC 785-MP controllers work together on a single alfa-network, it is recommended that MC 785-MP controllers with similar software version numbers should be used. Controllers with different software version numbers may not work together properly.

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 4 of 28

Front

Display	: 4-digit digital display (meetw) 4-digit digital display (set) 4-digit digital display (dag, tijd)	for measured temperature / humidity for setpoint setting for hours counter, real-time clock with 7 day LEDs and measured internal RH value
LEDs	: °C (measured value) %RH (measured)              Sper (Blocking) °C setp. %RH setp. 	= LED Readout of measurement in °C on display = LED Readout of measurement in %RH on display = LED Defrosting active = LED Cooling active = LED Heat regulation active = LED Fan active (relay functions "fan on while cooling evaporator" and/or "fan on during ventilation") = LED Blocking time active = LED Daytime mode active = LED Night-time mode active = LED Alarm active (blinking) = LED Drying active = LED Humidifying active = LED Readout setpoint value in °C on display = LED Readout setpoint value in %RH on display = LED Automatic ventilation active (Fan mode cooling = automatic) = LED Manual ventilation active (continuous)

The defrosting active LED blinks when the controller wants to defrost or has requested defrosting, but is still unable to do so.

The ventilator LED lights up when a fan is on. This could be due to relay functions "fan on while cooling an evaporator" (P401, P965 and P967) and/or "fan on during ventilation" (P402 to 412, P968).

The daytime mode active or night-time mode active LEDs next to the right display blink when rain is detected.

The alarm active LED lights up continuously during the time that the door is open (door contact). P902 controls the maximum time.

The drying active LED blinks when the controller wants to dry but is unable to do so because a defrost cycle is still running or has been requested.

The humidification active LED blinks when the controller wants to humidify but is unable to do so because cooling is still under way, whereas cooling and humidifying at the same time are not allowed (P562).

If a "Cleaning log" command (given through the RS485 network) is being carried out, the leftmost decimal point in the temperature display (at the upper left) will blink.

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 5 of 28

Buttons	: AAN/UIT (ON/OFF) SENS. SETP. ▲ ▼ PRG ⌚ (FAN) INKOEL FASE BEWAAR FASE ⌚ (CLOCK) ☀ (DAY) 🌙 (NIGHT)	= on/off button for the controller with LED = sensor select button = setpoint pushbutton with LED = up button = down button = programming button with LED = ventilator mode button (auto or continuous) = pre-cooling phase start button with LED = storing phase start button with LED = button for setting the clock = manual button daytime mode with LED = manual button night-time mode with LED
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Inputs and outputs

Sensors	: Temperature sensor-1 (Progr.) Temperature sensor-2 (Progr.) Temperature sensor-3 (Progr.)	(Pt-100, 3-wire DIN/IEC 751) (Pt-100, 3-wire DIN/IEC 751) (Pt-100, 3-wire DIN/IEC 751)
Digital input	: Digital input 1 (Progr.)	(C/NO, potential-free connection)
Communication	: I ² C network (max. 5 m) RS485 network (max. 1 km)	(2-wire shielded; 0V, SDA, SCL) (2x twisted-pair shielded; 2x GND, A, B)
Relays outputs	: RY1 Relay-1 (Progr.) The next relays have one central common (C); RY2 Relay-2 (Progr.) RY3 Relay-3 (Progr.) RY4 Relay-4 (Progr.) RY5 Relay-5 (Progr.)	(C/NO/NC, 250VAC/10A niet inductief) (NO, 250VAC/10A non-inductive) (NO, 250VAC/10A non-inductive) (NO, 250VAC/10A non-inductive) (NO/NC, 250VAC/10A non-inductive)
Analog output	: Analog output 1 (Progr.)	(0V/Signal, 0 to 10VDC)

NOTE!

Input and output functions can be programmed using the internal parameter settings.

NOTE!

Set up an **RS485-network** using 2x twisted pair shielded cable (at least 0,5mm²), where;

Pair-1: has line-A connected with line-A and
line-B connected with line-B.

Pair-2: has 2x GND (0V) connected with 2x GND (0V).

Shield: the shielding must only be connected to a clean earth on 1 side of the cable.

Make sure that the cable is laid without branches, up to a maximum total length of 1km.

Both ends of the RS485-network cable must also be terminated with a 250-ohm resistor between line A and line B. If an Interface is placed at the end of the network cable, then we advise to use the termination jumpers on the Interface, instead of a resistor to terminate the network cable.

Set up the **I²C bus extender** with a 2x 0.75mm² shielded cable, where;

SCL: SCL must be connected to SCL and

SDA: SDA must be connected to SDA

Shield: the shielding is connected to 0V (do not connect to earth).

Make sure that the cable is laid without branches, up to a maximum total length of 5 metres. This cable does not have to be terminated.

See installation diagram at the back of this manual.

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 6 of 28

1.2 LMS RELAY MODULE (extension): (Maximum of 4 modules (using address jumper settings))

Type number	:	901.000212	
Supply	:	12 VDC (1,2 VA)	
Communication	:	I ² C network	(3-wire 0V,SDA,SCL)
Address jumpers	:	Relay module 1; Relay module 2; Relay module 3; Relay module 4;	install J1 and J2 (Relais 6 to 9) install J1 and do not install J2 (Relais 10 to 13) install J2 and do not install J1 (Relais 14 to 17) do not install J1 and J2 (Relais 18 to 21)
Relays outputs	:	RY1 Relay 6 (Progr.) RY2 Relay 7 (Progr.) RY3 Relay 8 (Progr.) RY4 Relay 9 (Progr.)	(C/NO/NC, 250Vac/10A non-inductive) (C/NO, 250Vac/10A non-inductive) (C/NO, 250Vac/10A non-inductive) (C/NO, 250Vac/10A non-inductive)

Note! **Relay functions are programmable through the internal parameters settings.**

1.3 LMS Pt100 MODULE (extension): (Maximum of 4 modules (using address jumper settings))**

Type number	:	901.000272	
Supply	:	12 VDC (1,2 VA)	
Communication	:	I ² C network	(3-wire 0V,SDA,SCL)
Address jumpers	:	Pt100 module 1; Pt100 module 2; Pt100 module 3; Pt100 module 4;	install J1 and J2 and do not install J3 (Sensor 4 to 7) install J2 and do not install J1 and J3 (Sensor 8 to 11) install J1 and J2 and do not install J3 (Sensor 12 to 15) do not install J1, J2 and J3 (Sensor 16 to 19)
Pt100 inputs	:	Temperature sensor-1 (Progr.) Temperature sensor-2 (Progr.) Temperature sensor-3 (Progr.) Temperature sensor-4 (Progr.)	(Pt100, 3-wire DIN/IEC 751) (Pt100, 3-wire DIN/IEC 751) (Pt100, 3-wire DIN/IEC 751) (Pt100, 3-wire DIN/IEC 751)

Note! **Sensor functions are programmable.**

1.4 LMS RH/Pt100 MODULE (extension): (Maximum of 4 modules(using address jumper settings))**

Type number	:	901.000315	
Supply	:	12 VDC (1,2 VA)	
Communication	:	I ² C network	(3-wire 0V,SDA,SCL)
Address-jumpers	:	RH/Pt100 module 1; RH/Pt100 module 2; RH/Pt100 module 3; RH/Pt100 module 4;	install J1 and J2 and do not install J3 (Sensor 4 to 7) install J2 and do not install J1 and J3 (Sensor 8 to 11) install J1 and do not install J2 and J3 (Sensor 12 to 15) do not install J1, J2 and J3 (Sensor 16 to 19)
Pt100 inputs	:	Temperature sensor-1 (Progr.) Temperature sensor-2 (Progr.)	(Pt100, 3-wire DIN/IEC 751) (Pt100, 3-wire DIN/IEC 751)
RH-sens. inputs	:	RH-sensor-1 (Progr.) (dc+(12V),rh+(0-1Vdc=0-100%RH),dc-(0V), 3-wire) RH-sensor-2 (Progr.) (dc+(12V),rh+(0-1Vdc=0-100%RH),dc-(0V), 3-wire)	

Note! **Sensor functions are programmable.**

**) Remark: The module numbers of the LMS PT100 MODULES and the LMS RH/Pt100 MODULES may not overlap (They both use the same address range). So don't use equal address-jumers settings on these both types.

1.5 LMS SUPPLY MODULE for extension modules

Type number	:	901.000213	
Supply	:	230 VAC, 50/60 Hz	
Output	:	3x 12 VDC (7 VA)	

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 7 of 28

2. Functional specifications

- De MC 785-MP has three phases, namely the pre-cooling phase, the storing phase and the standby phase.
 - In the standby phase, the controller only assists for hot gas defrosting, where this controller itself cannot defrost.
 - During the pre-cooling phase, the controller cools continuously (if the temperature is higher than the setpoint temperature).
 - During the storing-phase the controller cools once during the cycle time (P307) minutes until the temperature has dropped again or is equal to the setpoint temperature. During this cooling, other controllers connected to the network are blocked too, so that only one group (a group may have multiple controllers) is cooling. If the temperature has exceeded the setpoint temperature plus the forced cooling temperature (P306), cooling will always be activated, despite the fact that the controller in the network is not allowed to cool. In that case cooling will take place until setpoint temperature has been reached. This is done to avoid a situation where it will not be possible within the cycle time, in the case of a large number of controllers, to cool all units until they have reached the setpoint temperature.
- The control parameters can be adjusted through internal programming.
- A choice can be made between no defrosting, natural defrosting, electrical defrosting and hot gas defrosting. Defrosting occurs on real-time basis (with no more than 12 switching points) or after an interval (P156), which can be set between 1 and 48 hours. As long as the temperature of the evaporator exceeds the defrost release temperature (P517), defrosting cannot be started. The ventilator switches on again after defrosting, once the ventilator delay time (P521) has ended.
 - a. no defrosting
The ventilator relay runs if the thermostat requests it to. After cooling has stopped, the fan will run on for a programmable delay time (P401).
 - b. natural defrosting
Ventilator control during cooling as for (a). The fan runs on during defrosting. The defrost relay will not switch on during defrosting. The defrost will finish on time (P518).
 - c. electrical defrosting
Ventilator control during cooling as for (a). Defrosting is stopped based on temperature (P159), with a time limit (P518). Defrosting is also stopped if an input with defrost stop function (P101, P102, P103 or P151) is closed. The ventilator is turned off during defrosting. After defrosting, cooling and ventilator will be blocked during the drip-dry time (P520), after which the ventilator switches on again once the ventilator delay time (P521) has expired. In the event of a negative ventilator delay time (P521) the ventilator will run for P521 seconds and cooling will start only after that.
 - d. hot gas defrosting
Ventilator control during cooling as for (a). With hot gas defrosting, the network will ask whether one or more other units are cooling. If this is not the case, the controller will wait for 15 minutes. If no units at all are cooling after that time, then cooling will be switched on for the unit for which the target value differs most from the setpoint (for mechanical cooling, see P304). Defrosting is stopped based on temperature (P159), with a time limit (P518). Defrosting is also stopped if an input with a defrost stop function (P101, P102, P103 or P151) is closed. The fan is turned off during defrosting. After defrosting, cooling and ventilator will be blocked during the drip-dry time (P520), after which the fan comes on again once the ventilator delay time (P521) has expired. In the event of a negative ventilator delay time (P521), the fan will run for P521 seconds and cooling will start only after that.

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 8 of 28

- If a sensor input that is used as an alarm input contact is closed, cooling (and the fan) will stop and the alarm LED will light (to indicate this).

- Operation of heating control

Heating control of the controller will be active if the temperature setting is below the setpoint temperature minus the differential (P573 differential heating), and will stop again if the temperature setting exceeds the setpoint temperature. The additional limitation here is that heating control can only be activated P563 minutes after cooling. This also requires a heat sensor (blow-in sensor).

Using the analogue output and/or relay heating (open and closed), the heating control tries to make sure that the temperature of the heat sensor (blow-in sensor) reaches the setpoint temperature. The heating setpoint must be adjusted to its correct value.

- Working method: drying

The controller's drying regulation function is activated through a manual start or when the inside RH value exceeds the RH setpoint plus the RH drying differential (P563).

Depending on the settings and the available measurements, drying will take place for a certain time interval (P558, if there is no inside RH measurement), or until the inside RH is lower than the RH setpoint.

There will be no drying if the defrost cycle is still running or has been requested.

The method of drying and the settings that will be used can be adjusted using the internal parameters.

Relay functions "fan on while cooling an evaporator" and "fan on during ventilation" are active during drying.

If heating is desired too, its settings have to be adjusted as well (heating setpoint and parameters).

- Working method: humidification

The controller's humidification regulator function is activated (depending on the settings) by a manual start, because a lower RH value is measured inside than the RH setpoint minus the RH humidification differential (P550), or based on a time interval (if an inside RH measurement is not available).

The time interval can be selected optionally to be an elapsed clock time or an effective cooling time. The time interval starts again after humidification has been concluded, after a cut-off has been cancelled, and also after:

- humidification has ended
- cut-off function has been cancelled
- door has been closed (provided P906 = 1)

If cooling is still under way, as humidification and cooling at the same time are not allowed (P562); cooling will be stopped (if allowed because of hot gas supply).

During humidification (even when waiting until cooling has stopped), the relay functions "fan on while cooling an evaporator" will be active.

Humidification stops after the RH setpoint has been reached or when the maximum humidification time (P551) has expired (if no inside RH measurement is available).

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 9 of 28

3. Control

After the controller has been provided with a power supply, you have to wait a few seconds before the controller functions. The upper right display shows "St.UP" (= Startup).

The displays on the left indicate the measured temperature during normal operation and the current setpoint temperature. If desired, the display on the right indicates time, the number of cooling pulses, cooling hours or the measured inside RH value.

3.1 Turning the controller on/off

The **ON/OFF** button activates or deactivates the controller.

3.2 Reading out the sensor groups

The average temperature of the active control sensors is shown on the temperature display during normal operation. It is possible to read out the temperature and humidity of other active sensor groups by pressing the **SENS.** button one or more times. To indicate what is being shown, the display on the right shows which sensor group is being shown:

Prod	:	the average value of the product sensors
buit	:	the average value of the outside sensors
inbl	:	the average value of the heating sensors (blow-in sensors)
ont1,2,3	:	the lowest sensor from the defrost sensors from evaporator 1, 2 or 3
rhin	:	the average of the rh inside.
rhou	:	the average of the rh outside.

The readout always returns to the average value of the active control sensors after 20 seconds.

3.3 Reading out sensors apart

Push the **SETP.** button and the **SENS.** button at the same time; the temperature display shows the value of sensor-1, while in the right display "SE 1" is shown to indicate that sensor-1 is being displayed now. Pressing the **UP** and/or **DOWN** button will display the subsequent sensors ("SE 2", "SE 3" etc.).

Pressing the **ON/OFF** button or not pressing any key for 20 seconds will let the controller return to normal operation.

3.4 Reading out and changing setpoints

To change the setpoints, press the **SETP.** button. The decimal point on the setpoint display will start to blink. The value can now be changed using the **UP** and **DOWN** buttons.

Pressing the **SETP.** button again will display the next setpoint.

Daytime setpoint temperature, daytime RH setpoint, night-time setpoint temperature, night-time RH setpoint and heating setpoint will be shown successively.

The daytime/night-time LEDs and the %RH/°C LEDs indicate which setpoint is displayed.

The heating LED blinks and the LED °C lights up at showing the heating setpoint.

Pressing the **SENS.** button or not pressing any key for 20 seconds will let the controller return to normal operation.

If a temperature setpoint connection with another controller has been set using parameter P805, this can be viewed by showing in the measured-value display "n" symbol with the network number of the other controller behind it. Daytime and night-time temperature setpoints can be adjusted, but they will be set to the current temperature setpoint of the connected controller again within a few seconds (if present on the network).

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 10 of 28

3.5 Setting controller mode

The following phases can be selected to operate in:

Pre-cool phase: Pressing the **INKOEL-FASE** button will activate pre-cooling. The LED above this button lights up to indicate this.

Storing phase: Pressing the **BEWAAR-FASE** button will activate storing. The LED above this button lights up to indicate this.

Standby phase: Pressing the **INKOEL-FASE** button and the **BEWAAR-FASE** button at the same time lets the controller switch to the standby phase (provided P901 = 1), to indicate this mode, both LED's above both buttons will be blinking at the same time.

The controller remembers the phase to make sure that the phase will not change when switching off and on again.

3.6 Adjusting the ventilation cooling mode

Pressing the  (fan) button lets the ventilation cooling mode switch from automatic (⌚) ventilation to continuous (👉) ventilation (relay function "fan on while cooling an evaporator").

During electrical or hot gas defrosting, however, the fan will be switched off. The LEDs next to the setpoint display indicate the ventilation mode.

The controller remembers the ventilator cooling mode so that the ventilator cooling mode will not change when switching off and on again.

3.7 Adjusting the defrost mode

Parameter P501 is used to adjust the defrost mode to;

- No defrost
- Natural defrost
- Electrical defrost or
- Hot gas defrost

3.8 Starting defrosting manually

Pressing the **UP** and **DOWN** buttons at the same time will start forced defrosting (manually), independently of the defrost timer.

3.9 Starting humidification manually

Pressing the  (fan) and **PRG** buttons at the same time will start forced humidification (manually), independently of the humidifying timer.

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 11 of 28

3.10 Reading out and adjusting the time and pulse counters, reading inside RH

The upper right display indicates either the time, the number of cooling pulses, the cooling hour-meter or the inside RH. During normal operating condition is shown which was last selected with the  key, as described below;

Pushing the  key will show the clock time on the display. The left display will show 'cloc' to indicate that the clock time can be adjusted. The clock time can now be adjusted with the **UP** and **DOWN** keys. The day of the week is shown by the day LEDs and can be adjusted by pushing the **PRG** key for more than 1 second.

By pushing the **AAN UIT** key or pushing no key for more than 30 seconds the clock returns to its normal operation mode. As the **AAN UIT** key is used, than the other MC 785-MP controllers on the network will be synchronised with this new time of this controller.

By pushing the  key again the number of cooling pulses will be shown in the display. The left display now shows 'puls'. The number of cooling pulses is shown without a decimal point. It is also to distinguish whether the number of cooling pulses or hours is being displayed.

By pushing the **PRG** key for more than 1 second, the counter can be reset to 0.

By pushing no key for more than 15 seconds the controller returns to its normal operation mode.

By pushing the  key again the number of cooling hours will be shown in the display. The left display now shows 'uren'. The number of cooling hours is shown with a decimal point in the display. By pushing the **PRG** key for more than 1 second, the counter can be reset to 0.

By pushing no key for more than 15 seconds the controller returns to its normal operation mode.

By pushing the  key again the measured value of the inside RH-sensor is shown on the display. The left display now shows 'rhin'.

By pushing no key for more than 15 seconds the controller returns to its normal operation mode.

If the number of pulses or hours is larger than can be displayed on the display, "OFL" appears on the display to indicate overflow.

3.11 Manual day / night setting

By pushing the **DAY** or **NIGHT** key the controller can be manually set into day or night mode. This is also done automatically when the start-times are set in the parameters. The LEDs ☀ and ☀ next to the right display indicate the active day or night mode.

If the corresponding LED flashes, rain is being detected.

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 12 of 28

3.12 Manual start drying

By pushing the **DAY** and **NIGHT** keys simultaneously the function (manual) drying can be started.

3.13 Info menu

By pushing the **UP** and **ON/OFF** keys simultaneously the info menu is activated, meant for advanced users. The Info menu can also be activated when the controller is switched off.

In the upper left display 'info' is shown. In the lower left display the item number is shown, indicating which data appear in the right display. By pushing the UP and DOWN keys a item number can be selected.

Appendix A contains a list of items and their meaning. The day LED's mo .. so indicate the status of relay 1 .. 7.

By pushing the **ON/OFF** key or 15 minutes choosing no other item, the controller returns to its normal operation mode.

4. Adjusting internal parameters

Push the **PRG** key.

If parameter P908 is not zero it is necessary to enter a password before it is possible to enter the parameter menu. On the lower display appears 'code' and in the upper display the password can be entered. The first digit flashes and with the **UP** and **DOWN** key the value can be changed. If the digit has the right value it can be confirmed by pushing the **SETP.** key. Now the next digit can be entered. If the last digit has been confirmed the controller will check the code. If this is the correct code the parameter menu will be active. If the code isn't correct the controller will return to its normal operation mode.

If P908 is zero than the password check is skipped and the parameter menu is entered directly.

In the parameter mode appears P101 in the temperature display. This is the parameter number, which can be changed with the **UP** or **DOWN** key.

On the setpoint display appears the value from the parameter. By pushing the **SETP.** key and the **UP** or **DOWN** key simultaneously the value of this parameter can be changed.

By pushing the **ON/OFF** key or if no key is being pushed for 30 seconds the controller will return to its normal operation mode.

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 13 of 28

Parameter table.

Nr	Description	Range	Unit	Default
Sensors group:				
P 101	Function sensor-1 (MC 785-MP) 0 = not present 1 = control sensor 2 = product sensor 3 = defrost sensor 4 = defrost sensor evaporator 2 5 = defrost sensor evaporator 3 6 = outside temperature sensor 7 = heating sensor (inlet sensor) 8* = inside rh sensor (Only at LMS Pt100/RH) 9* = outside rh sensor (Only at LMS Pt100/RH) 10 = alarm contact in (no): controls uit 11 = door contact in (no): cooling + fan off during max. time (P 902) 12 = blocking contact in (no): everything off 13 = stop defrost (no)	0..7 and 10..13	-	1
P 102	Function sensor-2 (MC 785-MP)	0..7 and 10..13	-	2
P 103	Function sensor-3 (MC 785-MP)	0..7 and 10..13	-	3
P 104	Function sensor-4 (LMS-UNIT-1 Pt100-1)	0..7	-	0
P 105	Function sensor-5 (LMS-UNIT-1 Pt100-2)	0..7	-	0
P 106	Function sensor-6 (LMS-UNIT-1 Pt100-3 or RH-1)	# 0..7 or 8..9	-	0
P 107	Function sensor-7 (LMS-UNIT-1 Pt100-4 or RH-2)	# 0..7 or 8..9	-	0
P 108	Function sensor-8 (LMS-UNIT-2 Pt100-1)	0..7	-	0
P 109	Function sensor-9 (LMS-UNIT-2 Pt100-2)	0..7	-	0
P 110	Function sensor-10 (LMS-UNIT-2 Pt100-3 or RH-1)	# 0..7 or 8..9	-	0
P 111	Function sensor-11 (LMS-UNIT-2 Pt100-4 or RH-2)	# 0..7 or 8..9	-	0
P 112	Function sensor-12 (LMS-UNIT-3 Pt100-1)	0..7	-	0
P 113	Function sensor-13 (LMS-UNIT-3 Pt100-2)	0..7	-	0
P 114	Function sensor-14 (LMS-UNIT-3 Pt100-3 or RH-1)	# 0..7 or 8..9	-	0
P 115	Function sensor-15 (LMS-UNIT-3 Pt100-4 or RH-2)	# 0..7 or 8..9	-	0
P 116	Function sensor-16 (LMS-UNIT-4 Pt100-1)	0..7	-	0
P 117	Function sensor-17 (LMS-UNIT-4 Pt100-2)	0..7	-	0
P 118	Function sensor-18 (LMS-UNIT-4 Pt100-3 or RH-1)	# 0..7 or 8..9	-	0
P 119	Function sensor-19 (LMS-UNIT-4 Pt100-4 or RH-2)	# 0..7 or 8..9	-	0
	#) 8 and 9 only with LMS modules with RH sensors!!!!			
P 150	Alternative sensor names (sensor-group indications 'Prod', 'buit' en 'inbl' from paragraph 3.2 replaced by 'prd1', 'prd2' en 'prd3')	0 = no, 1 = yes	-	0
P 151	Function digital input 1 0 = not present 1 = rain detector (closed input at rain detected) 2 = stop defrost (stops defrost at closing the input)	0..2	-	0
Sensor offsets group: (for calibration)				
P 201	Sensor-1 offset (MC 785-MP)	-10.0..10.0	°C	0.0
P 202	Sensor-2 offset (MC 785-MP)	-10.0..10.0	°C	0.0
P 203	Sensor-3 offset (MC 785-MP)	-10.0..10.0	°C	0.0
P 204	Sensor-4 offset (LMS-UNIT-1 Pt100-1)	-10.0..10.0	°C	0.0
P 205	Sensor-5 offset (LMS-UNIT-1 Pt100-2)	-10.0..10.0	°C	0.0
P 206	Sensor-6 offset (LMS-UNIT-1 Pt100-3 or RH-1)	# -10.0..10.0	°C(%RH)	0.0
P 207	Sensor-7 offset (LMS-UNIT-1 Pt100-4 or RH-2)	# -10.0..10.0	°C(%RH)	0.0
P 208	Sensor-8 offset (LMS-UNIT-2 Pt100-1)	-10.0..10.0	°C	0.0
P 209	Sensor-9 offset (LMS-UNIT-2 Pt100-2)	-10.0..10.0	°C	0.0
P 210	Sensor-10 offset (LMS-UNIT-2 Pt100-3 or RH-1)	# -10.0..10.0	°C(%RH)	0.0
P 211	Sensor-11 offset (LMS-UNIT-2 Pt100-4 or RH-2)	# -10.0..10.0	°C(%RH)	0.0
	#) Remark: or Pt100 at LMS 4xPt100 module or RH at LMS 2xPt100+2xRH module			

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 14 of 28

Nr	Description	Range	Unit	Default
P 212	Sensor-12 offset (LMS-UNIT-3 Pt100-1)	-10.0..10.0	°C	0.0
P 213	Sensor-13 offset (LMS-UNIT-3 Pt100-2)	-10.0..10.0	°C	0.0
P 214	Sensor-14 offset (LMS-UNIT-3 Pt100-3 or RH-1)	# -10.0..10.0	°C(%RH)	0.0
P 215	Sensor-15 offset (LMS-UNIT-3 Pt100-4 or RH-2)	# -10.0..10.0	°C(%RH)	0.0
P 216	Sensor-16 offset (LMS-UNIT-4 Pt100-1)	-10.0..10.0	°C	0.0
P 217	Sensor-17 offset (LMS-UNIT-4 Pt100-2)	-10.0..10.0	°C	0.0
P 218	Sensor-18 offset (LMS-UNIT-4 Pt100-3 or RH-1)	# -10.0..10.0	°C(%RH)	0.0
P 219	Sensor-19 offset (LMS-UNIT-4 Pt100-4 or RH-2)	# -10.0..10.0	°C(%RH)	0.0
#) Remark: or Pt100 at LMS 4xPt100 module or RH at LMS 2xPt100+2xRH module				
Cooling group:				
P 300	Differential cooling	0,1..10,0	°C	0,5
P 301	Minimal cooling time	0..99	minutes	0
P 302	Minimal time between two cooling actions	0..99	minutes	0
P 303	Maximal cooling time during storage	0..99	minutes	99
P 304	Mechanical cooling during night offset 0 = off 1 = on 2 = on day temperature setpoint, however when temperature setpoint is linked (P805) to another controller than the current temperature setpoint of that controller is being used.	0..2	-	1
P 305	Maximal increasing cooling temperature below the setpoint, after which the cooling will forced stop	0..10.0	°C	0.5
P 306	Maximal temperature above the setpoint, after which the cooling will forced start	0..10.0	°C	1.5
P 307	Cooling cycle time during storage	10..240	minutes	90
P 308	Suction Valve Control 0 = The evaporator suction-valve is driven at the same moments as the evaporator liquid-valve (apart from a few seconds switching time). There is one exception, namely <u>during a defrost</u> <u>cycle</u> with several evaporators, one by one after the other electrical or hotgas defrosting while all other evaporators cool: In that situation at hotgas defrost the evaporator suction valve is again actuated after its suction valve delay time (P529) is finished and at electric defrost it is again actuated after both his suction valve delay time (P529) and his drip-off time (P520) are finished. (Software version 1.18 until 2.01 has not yet supported P308. It is the suction control valve in accordance with P308 = 0 as described above). 1 = The evaporator suction valve is always controlled, except during its hotgas defrost and P529 seconds thereafter.	0..1	-	0
P 320	Minimum adjustable temperature setpoint	-40.0..50.0	°C	-10.0
P 321	Maximum adjustable temperature setpoint	-40.0..50.0	°C	+40.0
*) Note: The night temperature setpoint is this still important because a requested action or running cool-action during the day/night transition still runs or will be completed on the basis of the night temperature setpoint.				

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 15 of 28

Nr	Description	Range	Unit	Default
Analog output group:				
P 340	Analog output voltage 0V at temperatuur (as P350=3)	-40..50.0	°C	-40.0
P 341	Analog output voltage 10V at temperature (as P350=3)	-40..50.0	°C	50.0
P 350	Function analog output (0..10V): 0 = air-valve drying 1 = air-valve cooling 2 = heating 3 = current temperature setpoint output	0..3	-	0
Cooling air valve group:				
P 351	Parameters described below only for P350 = 1 ! Minimum position air valve	0..100	%	0
P 352	Maximum position air valve	0..100	%	100
P 353	P-band air valve cooling	0..25.0	°C	5.0
P 354	I-time air valve cooling	0..99	minutes	0
P 355	Offset set point air valve cooling.	-15.0..15.0	°C	0.0
P 356	Minimum differential temperature between outdoor temp. and control temp. at which air valve cooling is possible	0..25.0	°C	3.0
P 357	Maximum position air valve at outdoor temp. below zero	0..100	%	50
P 358	Maximum position air valve at mechanical cooling	0..100	%	20
P 359	Air valve cooling during night offset 0 = off 1 = on 2 = at day set point, but at temperature setpoint coupling (P805) at the actual temperature setpoint of the controller to which it is been linked.	0..2	-	
P 360	Minimum inlet temperature	-10.0..40.0	°C	1.0
P 361	P-band for limitation on minimal inlet temperature	1..10.0	°C	5.0
P 362	I-time for limitation on minimal inlet temperature	0..99	minutes	0
Ventilation group:				
P 401	Ventilation delay after cooling switches off (relay function "ventilation during cooling evaporator")	0..99	minutes	0
P 402	Automatic ventilation mode: (relay function "automatic ventilation") 0 = no automatic ventilation 1 = automatic ventilation on real time 2 = automatic ventilation on pulse/pause	0..2	-	0
P 403	Pulse time automatic ventilation	0..999	minutes	0
P 404	Pause time automatic ventilation	0..999	minutes	0
P 405	Automatic ventilation start time nr-1 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 406	Automatic ventilation stop time nr-1 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 407	Automatic ventilation start time nr-2 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 408	Automatic ventilation stop time nr-2 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 409	Automatic ventilation start time nr-3 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 410	Automatic ventilation stop time nr-3 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 411	Automatic ventilation start time nr-4 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 412	Automatic ventilation stop time nr-4 (24.00 = not active)	00.00..24.00	hours:min	24.00

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 16 of 28

Nr	Description	Range	Unit	Default
Defrost group:				
P 501	Defrost type 0 = no defrost 1 = off cycle 2 = electrical 3 = hot gas	0..3	-	0
P 502	Defrost mode 0 = on real time base 1 = on interval base	0..1	-	0
P 503	Off cycle defrost if control temp higher than:	-10..0..40.0	°C	5.0
P 504	Defrost time 1 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 505	Defrost time 2 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 506	Defrost time 3 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 507	Defrost time 4 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 508	Defrost time 5 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 509	Defrost time 6 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 510	Defrost time 7 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 511	Defrost time 8 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 512	Defrost time 9 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 513	Defrost time 10 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 514	Defrost time 11 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 515	Defrost time 12 (24.00 = not active)	00.00..24.00	hours:min	24.00
P 516	Defrost interval time	#	1..480	0.1 hour
P 517	Defrost release temperature		-10..0..40.0	°C
P 518	Maximal defrost time	#	0..99	minutes
P 519	Defrost end temperature		-10..0..40.0	°C
P 520	Drip off time (Time runs from closing hot-gas valve / stop electric defrost of the last evaporator, at simultaneous cooling and defrosting than this time runs per evaporator)	#	0..99	minutes
P 521	Fan-on delay time after defrosting (applies to relay function "ventilation during cooling evaporator," time starts after drip-off time, when negative the fan will x minutes be on before any cooling action)		-10..99	minutes
P 522	Maximum number of cells which are defrosting electrical simultaneously		1..31	-
P 523	Maximum number of cells which are defrosting hot-gas simultaneously		1..31	-
P 524	Minimum number of cells cooling needed for hot-gas defrosting		1..3	-
P 525	Number of evaporators to be defrosted		1..3	-
P 526	Alarm delay after defrost		0..500	minutes
P 527	All evaporators off during defrost (Blocks hot-gas defrost with its own evaporators)		0..1	-
P 528	Hot gas defrost possible with own evaporators		0..1	-
P 529	Delay time suction valve after defrost (see also P308) (Time runs from closing hot-ga valve / stop electric defrost)		0..999	seconds
P 530	Defrost interval on effective cooling time		0 = no, 1 = yes	-
P 531	During defrost with their own evaporators both evaporators on (cooling)		0 = no, 1 = yes	-
#) Attention: These parameters had a different unit in software versions lower than 3.00				

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 17 of 28

Nr	Description	Range	Unit	Default
Drying/humidifying group:				
	Remark: Assign analog output for air-valve drying with P350.			
P 550	RH differential	0..100.0	%	1.0
P 551	Maximal humidification time	0.99	minutes	10
P 552	Humidification interval	0.96	hour	10
P 553	Humidification interval on effective cooling time	0 = no, 1 = yes	-	0
P 554	Differential between absolute humidity indoor and outdoor where above drying with the valve will be used	0..50.0	g/kg	0.5
P 555	P-band valve control	0..50.0	g/kg	1.0
P 556	I-tijd valve control	0..99	minutes	0
P 557	Humidifying: 0 = off 1 = only at pre cooling 2 = at pre cooling and storing	0..2	-	1
P 558	Dry time	0..999	minutes	10
P 559	Minimum valve position	0..100	%	0
P 560	Maximum valve position	0..100	%	100
P 561	Drying type 1 = only with the valve 2 = only with cooling and heating 3 = both, automatically controlled 4 = only with external dryer	1..4	-	1
P 562	Cooling en humidifying at the same time	0 = no, 1 = yes	-	0
P 563	Time between cooling and heating	0..200	minutes	0
P 564	RH differential drying	0..100.0	%	1.0
Heating group:				
	Remark: Assign analog output for heating with P350			
P 570	P band heating	0.1..10.0	°C	2.0
P 571	I time heating	0.99	minutes	0
P 572	Run time heating valve	0..200	seconds	50
Alarms group:				
P 601	Absolute minimum alarm at pre cooling	-40..0..50.0	°C	0.0
P 602	Absolute minimum alarm delay at pre cooling	0..99	minutes	0
P 603	Absolute maximum alarm at pre cooling	-40..0..50.0	°C	50.0
P 604	Absolute maximum alarm delay at pre cooling	0..99	minutes	0
P 605	Relative minimum alarm at pre cooling	-40..0..50.0	°C	-10.0
P 606	Relative minimum alarm delay at pre cooling	0..99	minutes	0
P 607	Relative maximum alarm at pre cooling	-40..0..50.0	°C	10.0
P 608	Relative maximum alarm delay at pre cooling	0..99	minutes	0
P 609	Absolute minimum alarm at storing	-40..0..50.0	°C	0.0
P 610	Absolute minimum alarm delay at storing	0..99	minutes	0
P 611	Absolute maximum alarm at storing	-40..0..50.0	°C	50.0
P 612	Absolute maximum alarm delay at storing	0..99	minutes	0
P 613	Relative minimum alarm at storing	-40..0..50.0	°C	-10.0
P 614	Relative minimum alarm delay at storing	0..99	minutes	0
P 615	Relative maximum alarm at storing	-40..0..50.0	°C	10.0
P 616	Relative maximum alarm delay at storing	0..99	minutes	0
P 617	Action at minimum alarm: 0 = Only report with alarm relay 1 = Report with alarm relay and everything off	0..1	-	0
P 618	Action at maximum alarm: 0 = Only report with alarm relay 1 = Report with alarm relay and everything off	0..1	-	0

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 18 of 28

Nr	Description	Range	Unit	Default
Blocking group:				
P 701	Blocking start time-1 Monday till Friday (24.00 = not active)	00.00..24.00	hours:min	24.00
P 702	Blocking stop time-1 Monday till Friday	00.00..24.00	hours:min	24.00
P 703	Blocking start time-2 Monday till Friday	00.00..24.00	hours:min	24.00
P 704	Blocking stop time-2 Monday till Friday	00.00..24.00	hours:min	24.00
P 705	Blocking start time-3 Monday till Friday	00.00..24.00	hours:min	24.00
P 706	Blocking stop time-3 Monday till Friday	00.00..24.00	hours:min	24.00
P 707	Blocking start time-4 Monday till Friday	00.00..24.00	hours:min	24.00
P 708	Blocking stop time-4 Monday till Friday	00.00..24.00	hours:min	24.00
P 709	Blocking start time-1 Saturday till Sunday	00.00..24.00	hours:min	24.00
P 710	Blocking stop time-1 Saturday till Sunday	00.00..24.00	hours:min	24.00
P 711	Blocking start time-2 Saturday till Sunday	00.00..24.00	hours:min	24.00
P 712	Blocking stop time-2 Saturday till Sunday	00.00..24.00	hours:min	24.00
P 713	Blocking start time-3 Saturday till Sunday	00.00..24.00	hours:min	24.00
P 714	Blocking stop time-3 Saturday till Sunday	00.00..24.00	hours:min	24.00
P 715	Blocking start time-4 Saturday till Sunday	00.00..24.00	hours:min	24.00
P 716	Blocking stop time-4 Saturday till Sunday	00.00..24.00	hours:min	24.00
Network group:				
P 801	Network number (set a unique number for each controller in the network)	1..31	-	1
P 802	Storage group number: Controllers with equal group numbers will cool simultaneously during storage (0 = not active)	0..31	-	0
P 803	Cooling capacity of this cell (If P 802 = 0 than not active)	0..100	kW	0
P 804	Maximum cool capacity demand for pre-cooling	1..500	kW	500
P 805	Set point (day and night) linked to actual temperature set point of controller with network number (0 = set point not linked)	0..31	-	0
P 806	Pre-cooling group number: Controllers with equal group numbers will cool simultaneously during pre-cooling (0 = not active)	0..31	-	0
Others group:				
P 901	Cell may be used as standby-cell if hot-gas is needed	0 = no, 1 = yes	-	0
P 902	Maximum time door open	0..92	minutes	5
P 903	Heating off when door is open	0 = no, 1 = yes	-	1
P 904	Fan off when door is open	0 = no, 1 = yes	-	1
P 905	Cooling off when door is open	0 = no, 1 = yes	-	1
P 906	Humdifying off when door is open	0 = no, 1 = yes	-	1
P 907	Log interval	1..120	minutes	5
P 908	Password ([0000] = not active)	[0000].[9999]	-	[0000]
P 909	Air-valve is closed at rainfall (analogue output becomes 0Vdc, applicable if P350 = 0 or 1 and requires a rain-detector connected to the controller or on the master in the network)	0 = no, 1 = yes	-	1
P 910	Drying off at open door (cooling associated to drying set off with P905)	0 = no, 1 = yes	-	1
Start times group:				
P 920	Start time night set point (24.00 = not active)	00.00..24.00	hours:min	24.00
P 921	Start time day set point (24.00 = not active)	00.00..24.00	hours:min	24.00
P 922	Start time night set point weekend (24.00 = not active)	00.00..24.00	hours:min	24.00
P 923	Start time day set point weekend (24.00 = not active)	00.00..24.00	hours:min	24.00

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 19 of 28

Nr	Description	Range	Unit	Default
Relay assignment group:				
P 951	Function solenoid valve to Relay 0 = no Relay assigned 1..5 = Relays-1..5 on controller 6..9 = Relays-1..4 on LMS relays module 1 10..13 = Relays-1..4 on LMS relays module 2 14..17 = Relays-1..4 on LMS relays module 3 18..21 = Relays-1..4 on LMS relays module 4	0..21	-	0
P 952	Function solenoid valve evaporator-2 to relay	0..21	-	0
P 953	Function solenoid valve evaporator-3 to relay	0..21	-	0
P 954	Function suction valve to relay	0..21	-	0
P 955	Function suction valve-2 to relay	0..21	-	0
P 956	Function suction valve-3 to relay	0..21	-	0
P 957	Function off cycle defrost to relay (natural defrost)	0..21	-	0
P 958	Function Electrical defrost evap.-1 to relay	0..21	-	0
P 959	Function Electrical defrost evap.-2 to relay	0..21	-	0
P 960	Function Electrical defrost evap.-3 to relay	0..21	-	0
P 961	Function Hot gas defrost evap.-1 to relay	0..21	-	0
P 962	Function Hot gas defrost evap.-2 to relay	0..21	-	0
P 963	Function Hot gas defrost evap.-3 to relay	0..21	-	0
P 964	Function collect hot gas defrost to relay	0..21	-	0
P 965	Function ventilation during cooling evap.-1 to relay	0..21	-	0
P 966	Function ventilation during cooling evap.-2 to relay	0..21	-	0
P 967	Function ventilation during cooling evap.-3 to relay	0..21	-	0
P 968	Function ventilation during ventilation to relay	0..21	-	0
P 969	Function heating to relay	0..21	-	0
P 970	Function humidifying to relay	0..21	-	0
P 971	Function alarm to relay	0..21	-	0
P 972	Function heating valve open to relay	0..21	-	0
P 973	Function heating valve close to relay	0..21	-	0
P 974	Function external dryer to relay	0..21	-	0
Remark: It is possible to assign more than one function to a single relay. <u>Example:</u> Ventilation during cooling (P 956) and during ventilation (P 957) to the same relay.				
Software / production group:				
P 991	Software version number	-	-	-
P 992	Serial number	-	-	-
P 993	Production date	-	year/week	-

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 20 of 28

5. Sensor calibration

The temperature sensors 1 till 19 can be calibrated with the parameters P 201 till P 219. If a temperature-sensor shows 0,2°C to much, than the according sensor-offset must be lowered with 0,2°C.

6. Alarms

If a relay is configured (P 971) as a alarm relay (default relay-1), then normally the relay is closed and opens when an alarm occurs. So there is also an alarm given when the supply voltage has been cut off. During the LED alarm will flash on the front. Depending of the internal parameters the controller will stop or continue.

If the LED Alarm is on continuously, than the door contact is closed.

An alarm can be caused by one of the following messages:

Sensor failure :	E1	= Temperature sensor-1 regelaar Sensor-1 defect
	E2	= Temperature sensor-2 regelaar Sensor-2 defect
	E3	= Temperature sensor-3 regelaar Sensor-3 defect
	E4	= Temperature sensor-4 LMS module-1 Pt100-1 defect
	E5	= Temperature sensor-5 LMS module-1 Pt100-2 defect
	E5	= Temperature sensor-6 LMS module-1 Pt100-3(or RH-1) defect
	E6	= Temperature sensor-7 LMS module-1 Pt100-4(or RH-2) defect
	E4	= Temperature sensor-8 LMS module-2 Pt100-1 defect
	E5	= Temperature sensor-9 LMS module-2 Pt100-2 defect
	E5	= Temperature sensor-10 LMS module-2 Pt100-3(or RH-1) defect
	E6	= Temperature sensor-11 LMS module-2 Pt100-4(or RH-2) defect
	E4	= Temperature sensor-12 LMS module-3 Pt100-1 defect
	E5	= Temperature sensor-13 LMS module-3 Pt100-2 defect
	E5	= Temperature sensor-14 LMS module-3 Pt100-3(or RH-1) defect
	E6	= Temperature sensor-15 LMS module-3 Pt100-4(or RH-2) defect
	E16	= Temperature sensor-16 LMS module-4 Pt100-1 defect
	E17	= Temperature sensor-17 LMS module-4 Pt100-2 defect
	E18	= Temperature sensor-18 LMS module-4 Pt100-3(or RH-1) defect
	E19	= Temperature sensor-19 LMS module-4 Pt100-4(or RH-2) defect
Temperature alarm :	A lo	= Absolute minimum temperature alarm
	A hi	= Absolute maximum temperature alarm
	r lo	= Relative minimum temperature alarm
	R hi	= Relative maximum temperature alarm
Other alarms:	A1	= No hot gas defrost possible because there are no other MC 785-MP's in the network.

The alarm messages will appear on the temperature display (upper left).

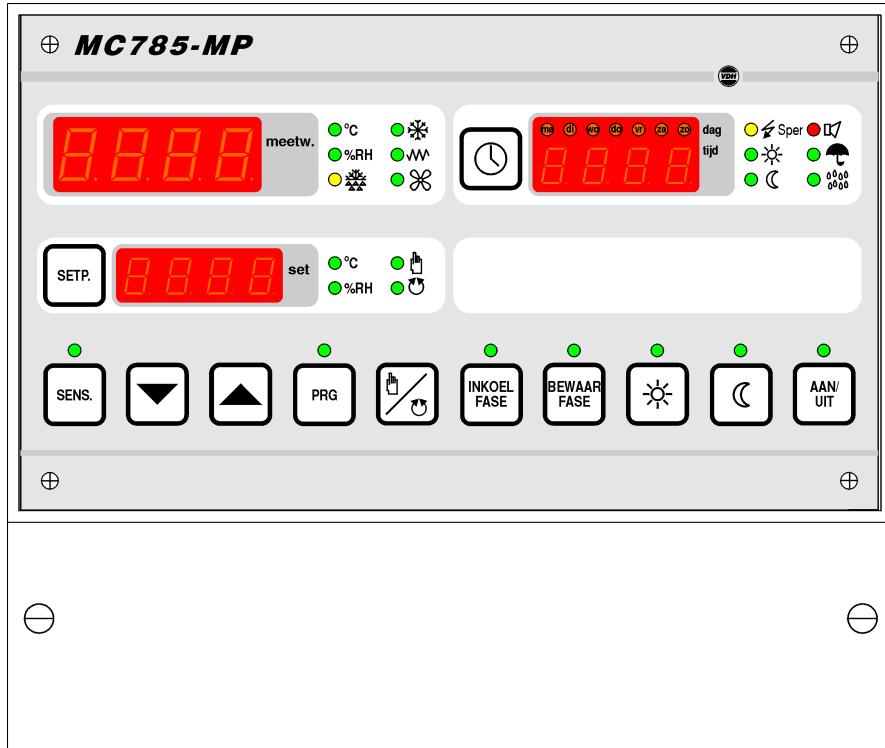
If a new alarm occurs, than it will first be displayed continuously on display.

New alarms can be confirmed one by one with the **UP** or **DOWN** button. If all new alarms are confirmed than the normal readout of the display will be shown alternating with the remaining alarms. With the **UP** or **DOWN** key you can toggle between the remaining alarms.

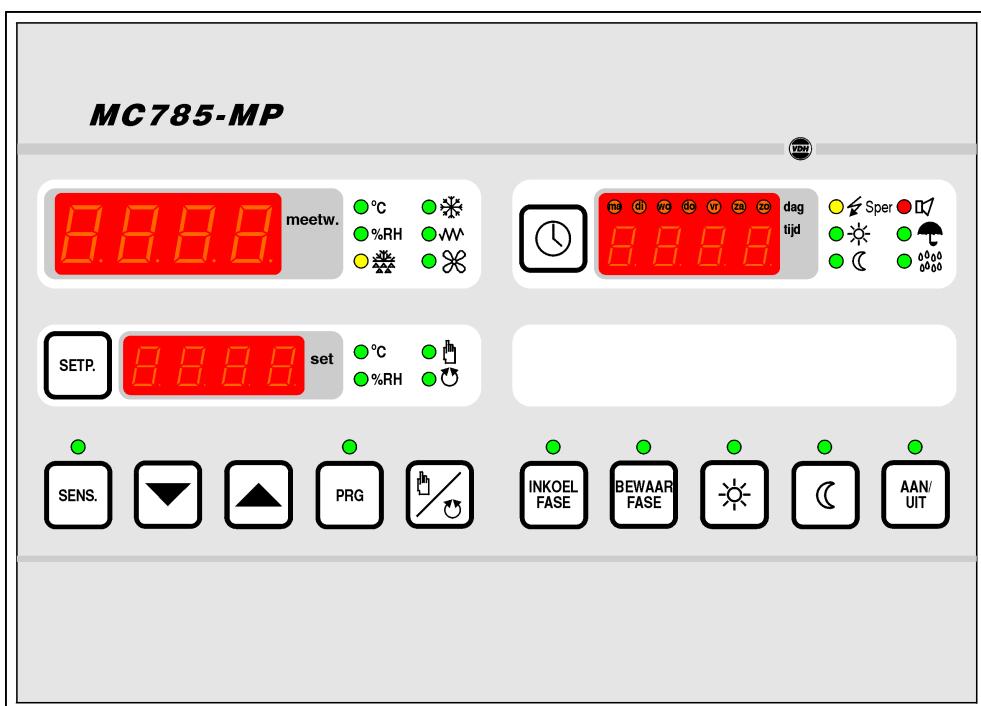
User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 21 of 28

7. Front view

Front view MC 785-MP wall mounting; drawing 040241w0

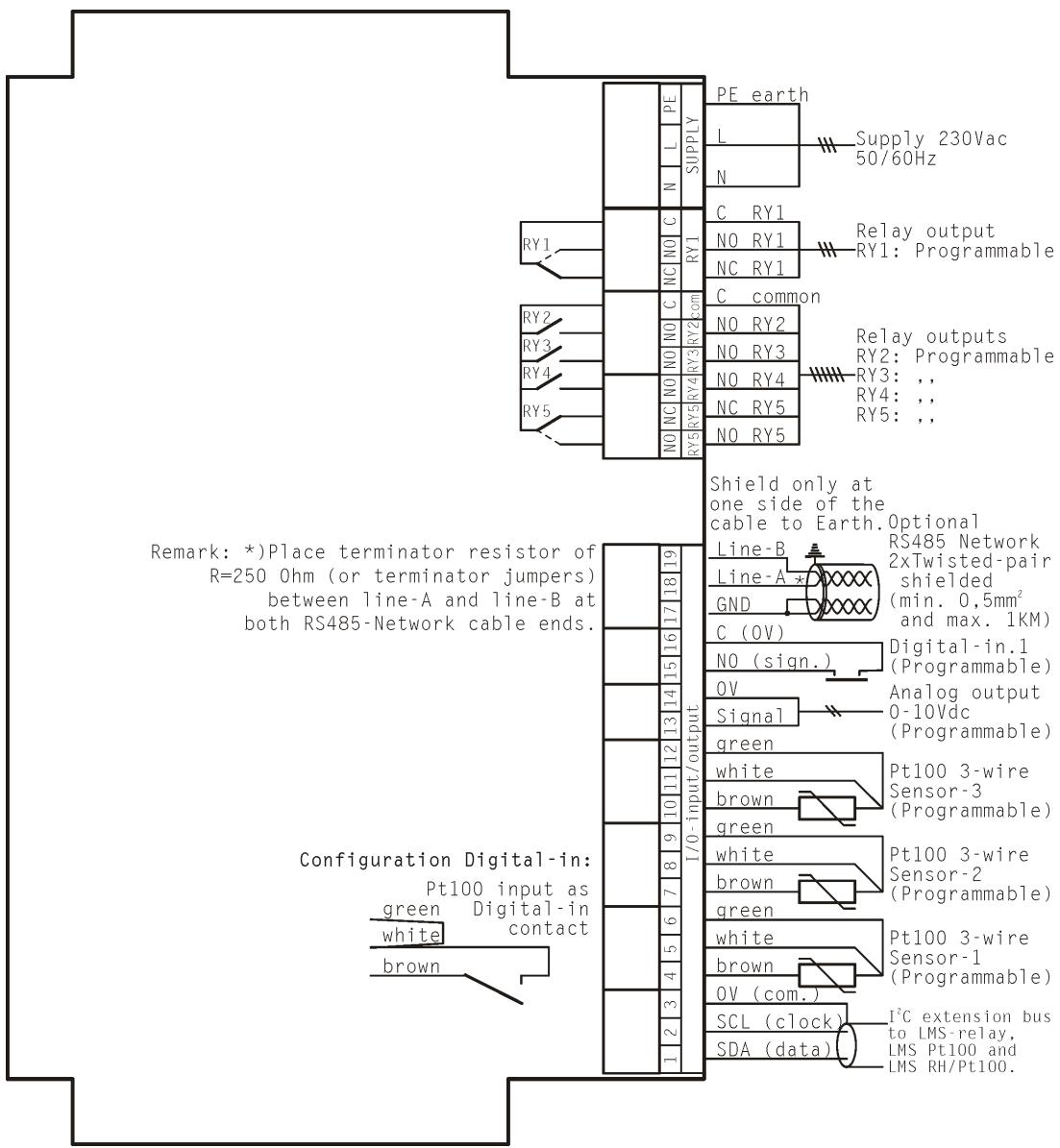


Front view MC 785-MP panel mounting; drawing 041864w0

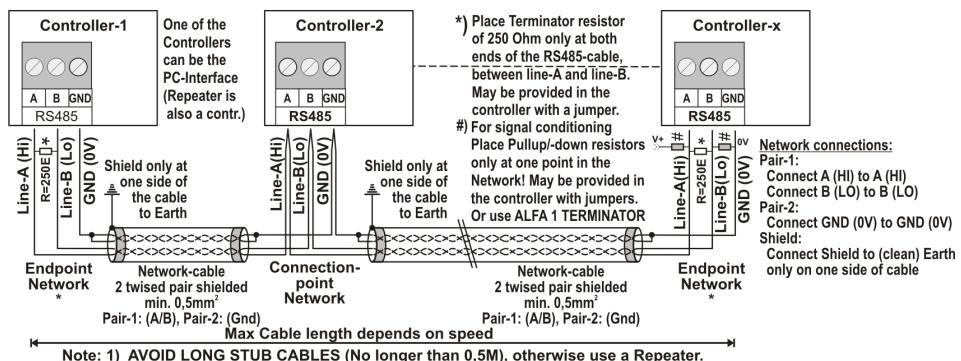


8. Connections

Connections diagram MC 785-MP wall mount; drawing 031878w1

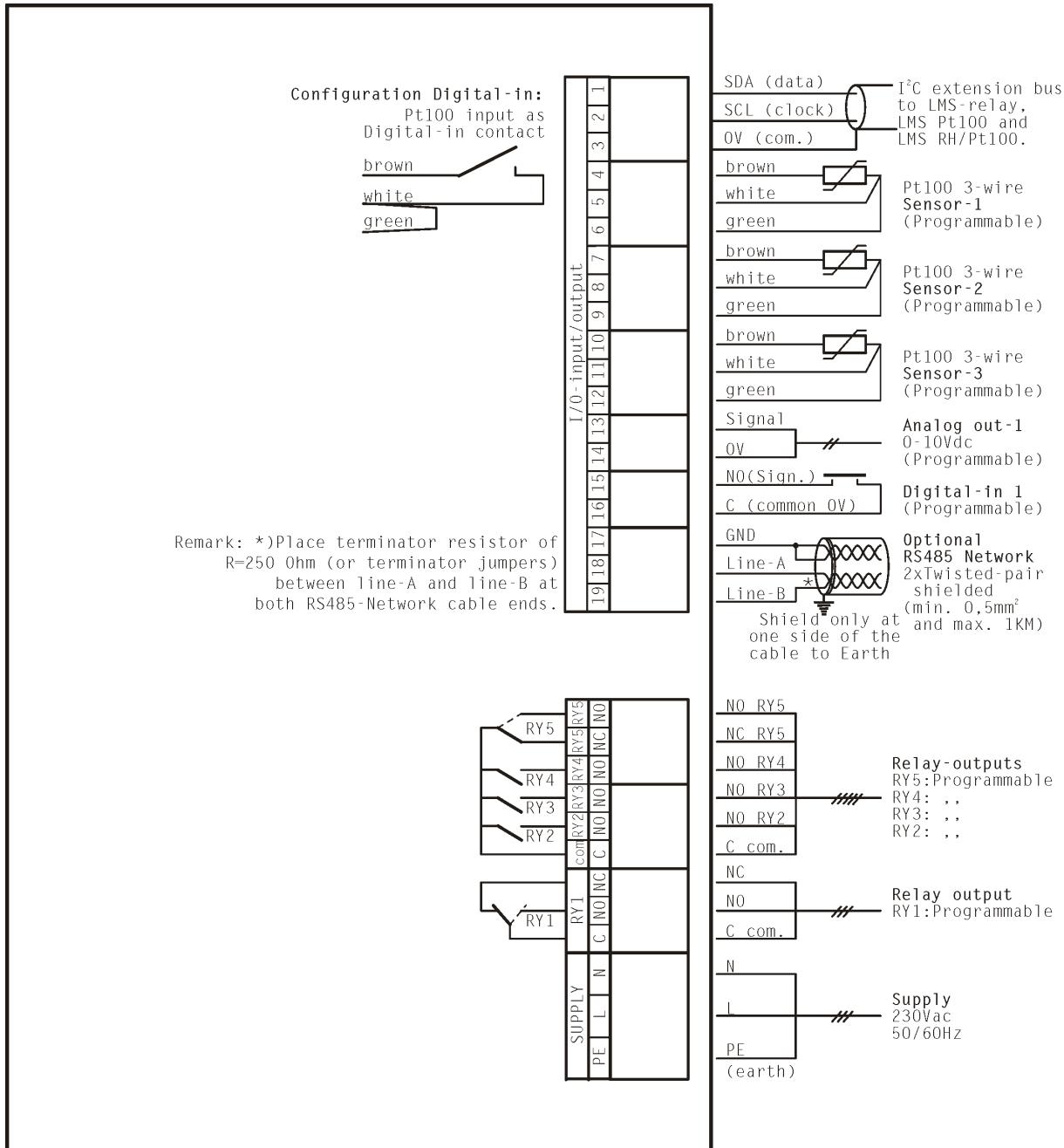


RS 485 NETWORK CONNECTIONS 2-twisted pair shielded cable:



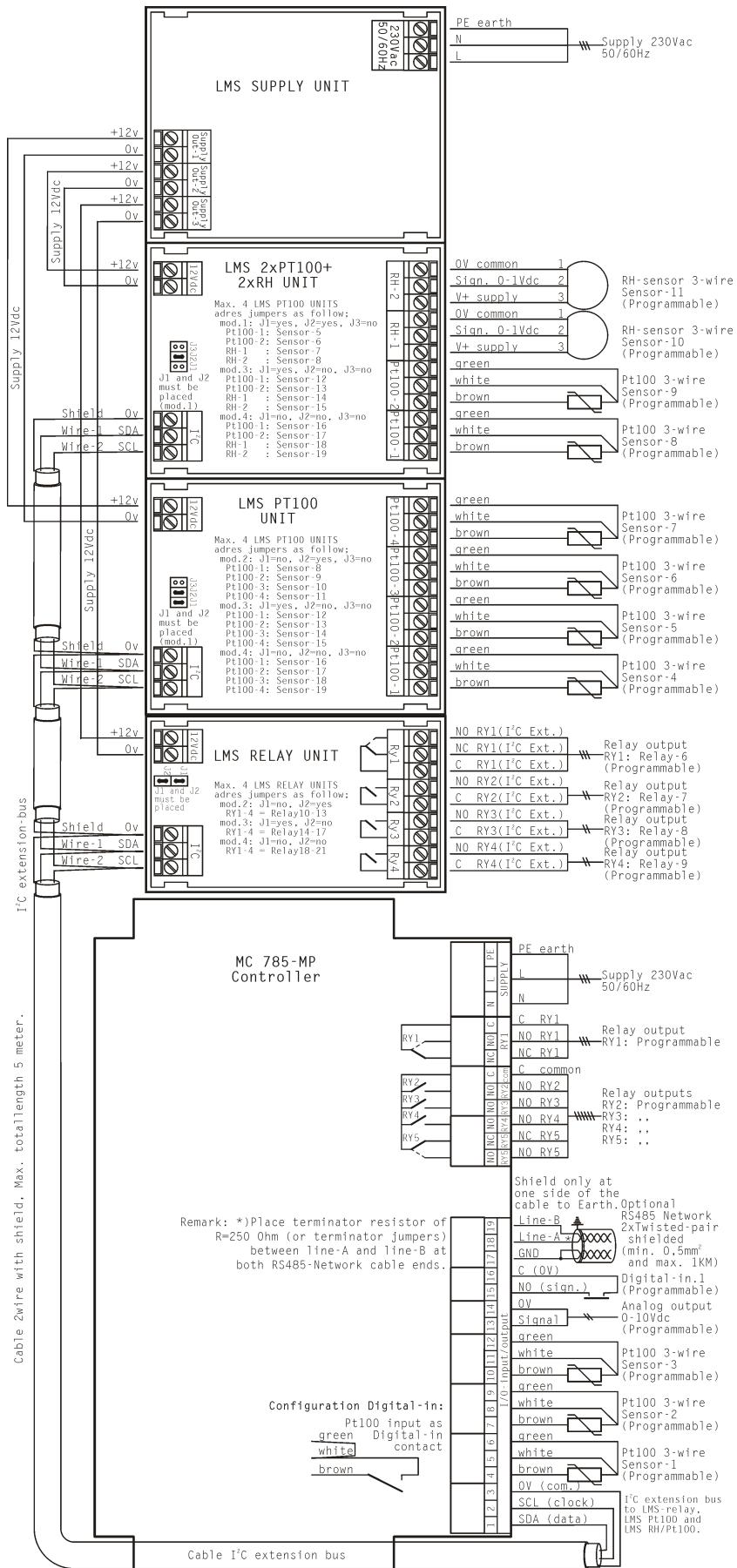
User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 23 of 28

Connections diagram MC 785-MP panel mount; drawing 041863w1



User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 24 of 28

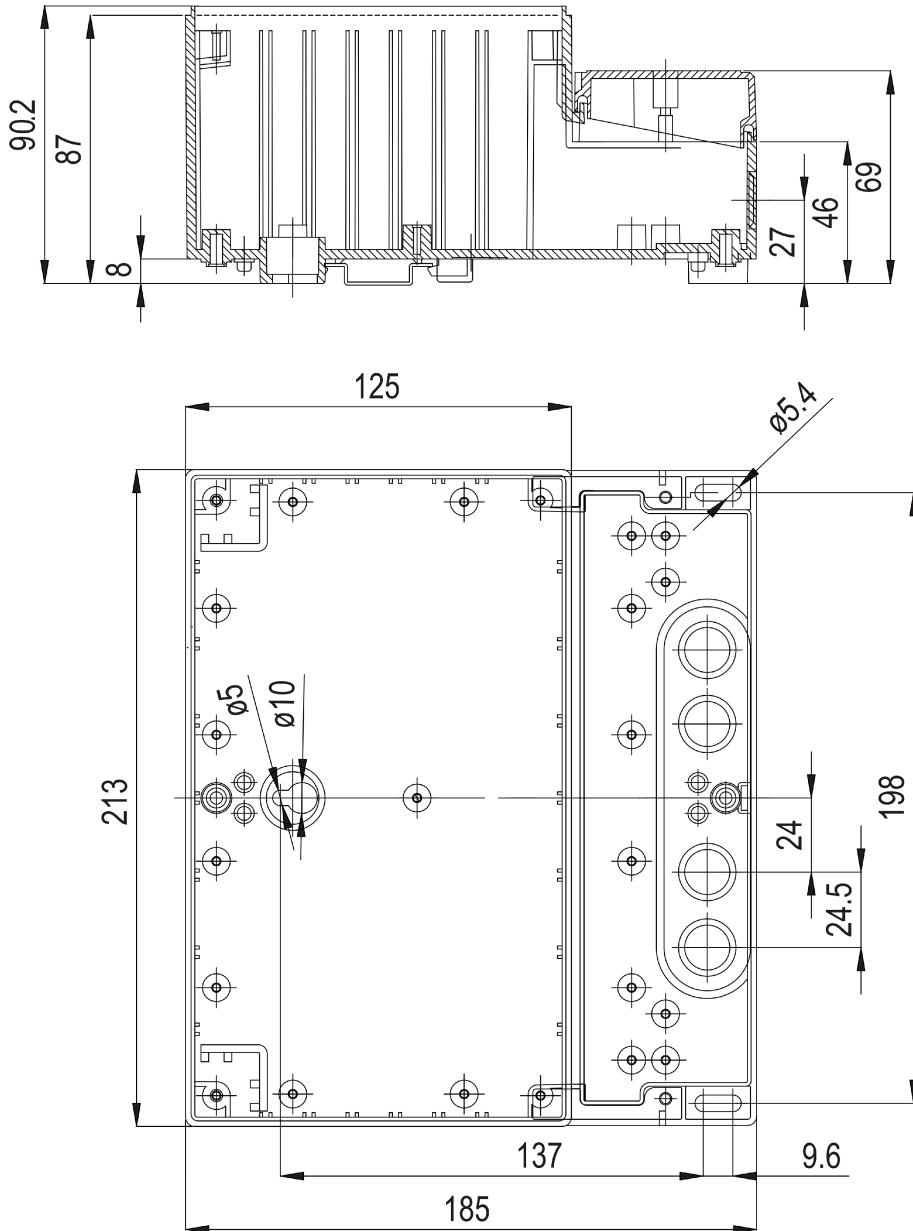
Connections diagram MC785-MP with LMS-units; drawing 032152w1:



User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 25 of 28

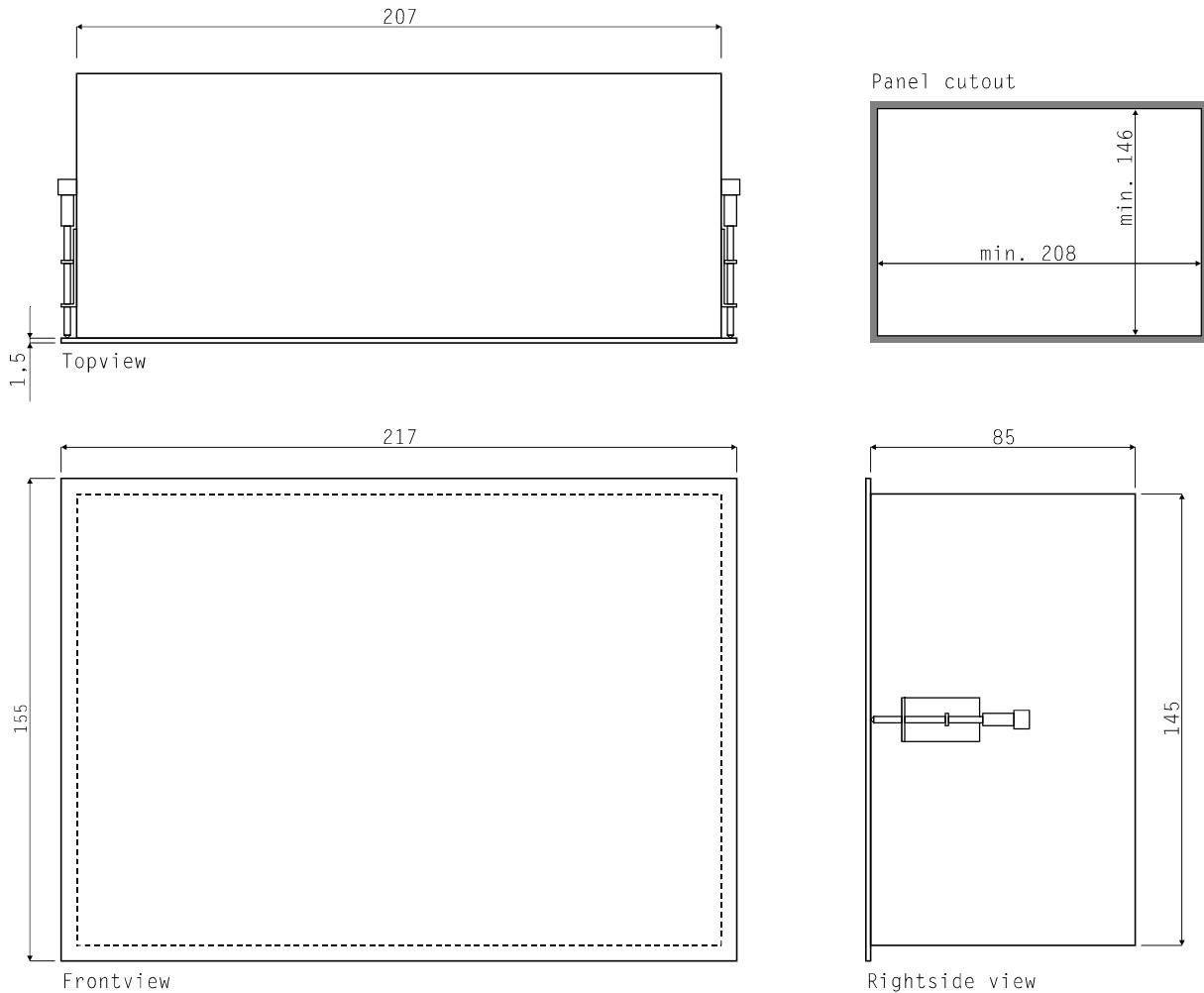
9. Dimensions

Dimensions MC785-MP wall mount; drawing 940024

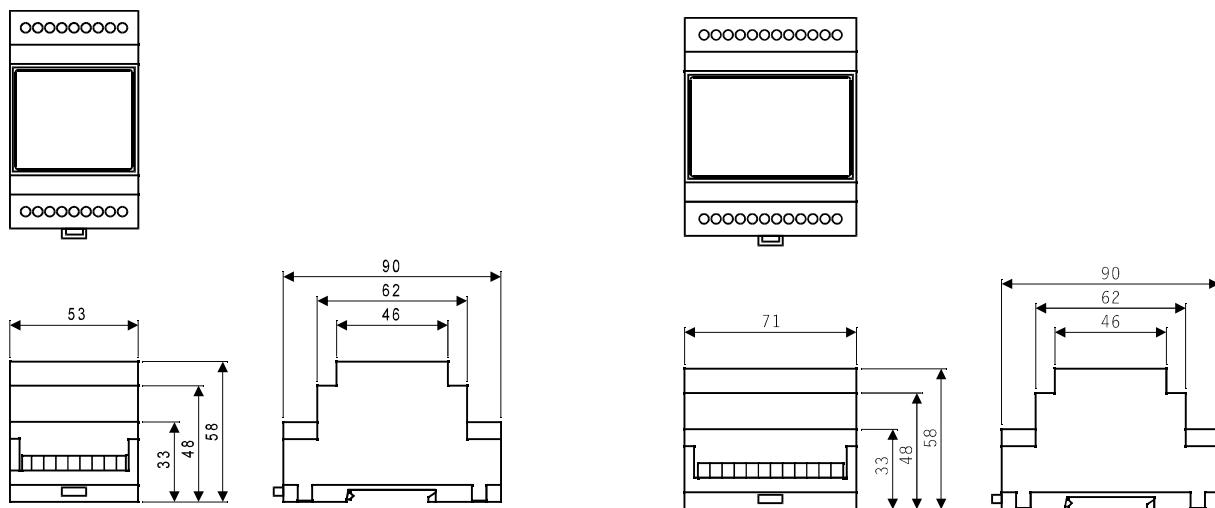


User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 26 of 28

Dimensions MC785-MP panel mount; drawing 961271



Dimensions LMS Relay-module; drawing 970983 LMS Supply-, Pt100-, RH/Pt100-module; dr. 970908



User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 27 of 28

Appendix A: Items in the info menu

Item	Meaning/Values/Description
0	Master/slave mode <ul style="list-style-type: none"> 0 busy with determining 1 controller is slave 2 controller is master
1	Master-slave-counter, counter to determinate the master-slave-mode
2	Cool-mode <ul style="list-style-type: none"> 0 Cooling off 1 Cooling blocked 2 Cooling off, start permission requested 3 Cooling on until minimum cooling time 4 Cooling on until appropriate temperature is reached 5 Cooling on, stop cooling permission requested 7 Cooling off, time between cooling actions (P305) 6 Cooling off, in transition to next mode 8 Cooling on, stop permission requested for defrosting 20 One evaporator defrosting, one cools for hot gas, rest is off 21 One evaporator defrosting, rest cools 22 One evaporator defrosting, rest in transition to next mode 23 One evaporator defrosting (electric), rest is off (LED cool is lit at 3, 4, 5, 6, 8) <p>At cooling modes 20..23 the cooling mode in the display is complemented by the cool-sub mode (see item 21) separated by a dot.</p>
3	Cool-command from master, see Cool-mode
4	Defrost-mode <ul style="list-style-type: none"> 0 Defrost off 1 Defrost off, start permission requested 2 Defrost off, start natural defrost permission requested 3 Defrost off, start electric defrost permission requested 4 Defrost off, start hot-gas defrost permission requested 10 Natural defrosting 11 Electric defrosting 12 Hot-gas defrosting 13 Defrost off, dripping off 14 Defrost off, in transition to next mode 15 Defrost off, pre-ventilation 16 One evaporator hot-gas defrosting, rest cooling or off 17 One evaporator electric defrosting, rest cooling or off 18 Defrost off, remaining suction valve delay is still running (LED Defrost flashes at 1, 2, 3, 4) (LED Defrost lit at 10, 11, 12, 13, 16, 17) <p>At defrost-modes 16 and 17 the defrost-mode in the display is complemented by the defrost-sub mode (see item 20) and the index of evaporator (see item 22) separated by a dot.</p>
5	Defrost-command from master, see defrost-mode
6	Number of controllers in COOLING PHASE or STANDBY that are cooling (only at master)
7	Number of controllers in MAINTAIN PHASE that are cooling (only at master)
8	Number of controllers with hot-gas defrost request (only at master)
9	Number of controllers busy with hot-gas defrost (only at master)
10	Number of controllers busy with electric defrost (only at master)

User manual	Document nr. : 080608	Version : V2.2
MC 785-MP	Client : General	Page : 28 of 28

Item	Meaning/Values/Description
11	Blocking active (depends on contact and P701..P716) 0 Not blocked 1 Blocked
12	Door-mode (depends on contact, P902..P906 and P910) 0 No blocking because of door > 0 One or more functions blocked by the door
13	Extern alarm (contact) 0 No alarm 1 Alarm
14	Number of MC 785-MP controllers detected on the network (only at master)
15	Forced cooling-counter (only at master)
16	Number of controllers available for forced cooling (only at master)
17	Humidifying-mode 1 No humidifying 2 Humidifying waits for cooling end 3 Active humidifying
18	Analog output percentage, 0..100 %
19	Heating-mode, "abc" (0 = function off, 1 = function on) a send heating-valve closing b send heating-valve opening c heating on
20	Defrost-sub-mode, valid at defrost-mode 16 and 17 1 evaporator to be defrosted is still cooling, stop permission requested 2 evaporator defrosting 3 evaporator not defrosting while dripping off 4 evaporator not defrosting, waiting at suction-valve delay 5 evaporator not defrosting, pre-ventilation
21	Cool-sub-mode, valid at cool-mode 20, 21, 22 and 23 values are reserved
22	Index (from 0) evaporators to be defrosted / defrosting at evaporators alternately defrost
23	Absolute humidity inside in g/kg (if known)
24	Absolute humidity outside in g/kg (if known)
25	Hot-gas defrost interrupted 0 Defrosting yet successful ended 1 Defrosting interrupted by blocking, alarm or master
26	Ventilation-mode, "abcd" (0 = function off, 1 = function on) a automatic ventilation b ventilation during cooling evaporator 1 c ventilation during cooling evaporator 2 d ventilation during cooling evaporator 3
30	Hexadecimal representation of energized relays 1..16 (bit 0..15) 0000 relay 1..16 not energized 0001 relay 1 energized, relay 2..16 not energized .. FFFF relays 1..16 energized
31	Hexadecimal representation of energized relays 17..21 (bit 0..4) 0000 relay 17..21 not energized 0001 relay 17 energized, relay 18..21 not energized .. FFFF relays 17..21 energized
